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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/661,512 | 09/15/2003 | Amber Sharma | 50103-563 | 7417 |
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| McDermott, Will & Emery 600 13th Street, N.W. Washington, DC 20005-3096 | | | EXAMINER PERRIN, JOSEPH L. | |
| | | | ART UNIT 1746 | PAPER NUMBER |

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/661,512

Applicant(s)

SHARMA ET AL. GA

Examiner

Joseph L. Perrin, Ph.D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-18 and 21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 12-18 and 21 is/are rejected.
- 7) ☒ Claim(s) 14-17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>20030915</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Regarding claims 13 & 14, the word "means" is preceded by the word(s) "reflective" & "movable partition", respectively, in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967). Applicant is directed to MPEP §2181(I) for the proper language that falls within 35 USC §112, sixth paragraph, which states:

A claim limitation will be interpreted to invoke 35 U.S.C. 112, sixth paragraph, if it meets the following 3-prong analysis:

- (A) the claim limitations must use the phrase "means for " or "step for ";
- (B) the "means for " or "step for " must be modified by functional language; and
- (C) the phrase "means for " or "step for " must not be modified by sufficient structure, material or acts for achieving the specified function.

Re claim 14, it is further noted that since the claimed "movable partition means" positively recites structure, the claim is construed as a "movable partition".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 12-13, 18 & 21 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,379,785 to Ohmori *et al.* (hereinafter "Ohmori"). Re claims 12, 18 & 21, Ohmori discloses an ultrasonic disc-shaped wafer cleaning method including providing an apparatus with an outer tank 9 (chamber having four walls and a bottom wall), ultrasonic wafer energy oscillators 7 (transducers) on a side wall, a wafer holder 21 (workpiece mounting means) positioned inside the outer tank to align the wafer perpendicular to the ultrasonic oscillators, and applying ultrasonic energy to both sides of the wafer (see entire reference of Ohmori, for instance, Figure 1 & col. 3, lines 17-48). Re claim 13, Ohmori also teaches reflecting the ultrasonic waves in the outer tank (for instance, col. 4, lines 18-28).

6. Claims 12-13, 18 & 21 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,849,091 to Skrovan *et al.* (hereinafter "Skrovan"). Re claims 12, 18 & 21, Skrovan teaches that it is conventional to use either ultrasonic energy or megasonic energy for enhancing cleaning action of wafer cleaning solutions (col. 1, lines 34-55) and further that it is known to treat a disc-shaped wafer with a cleaning apparatus 10 having a chamber 12 defining a volume to hold a cleaning solution 13, the chamber formed from sidewalls 14 & 16 and end

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walls 18 & 20, a transducer 24 forming at least a portion of a wall, and positioning the wafer in a workpiece mounting means (holder, not shown) within the chamber to arrange the wafer(s) perpendicular to the transducer and applying wave energy across both sides of the wafer (see entire reference of Skrovan, for instance, Figures 1-2, and col. 3, line 64 to col. 4, line 39). Re claim 13, Skrovan also teaches using a reflective surface 19 within the chamber (see, for instance, Figure 1 and relative associated text).

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 12-13, 18 & 21 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,220,259 to Brown *et al.* (hereinafter "Brown") as evidenced by either U.S. Patent No. 6,244,280 to Dryer *et al.* (hereinafter "Dryer") or applicant's admitted prior art. Re claims 12, 18 & 21, Brown discloses treating a disc-shaped wafer by sonic cleaning by providing an apparatus having a chamber 11 defining a volume to hold a cleaning solution 13, the chamber formed from walls 21, 27, 31 & 33, a sonic reflecting means 27a, 27b & 15 within

the chamber, a sonic wave generator (transducer) 23 forming at least a portion of a wall, positioning the wafer in a workpiece mounting means 41 within the chamber to arrange the wafer(s) perpendicular to the transducer and applying energy from transducer 23 across both sides of the wafer (see entire reference of Brown et al., for instance, Figures 1-3, and col. 2, line 36 to col. 4, line 39). Re claim 13, Brown further discloses reflecting the wave energy (see entire reference, for instance, col. 5, lines 4-14). Brown discloses using "sonic" transducers for cleaning wafers, and preferably megasonic transducers, but does not explicitly disclose using ultrasonic transducers. However, the position is taken that conventional sonic cleaning of wafers inherently includes ultrasonic and/or megasonic types of cleaning. This is evidenced by Dryer (col. 5, lines 5-8 & col. 6, lines 48-53) as well as applicant's admission (page 1, line 18 *et seq.*).

Allowable Subject Matter

9. Claims 14-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or reasonably suggest the claimed ultrasonic cleaning method further using a movable partition extending between opposing sidewalls and perpendicular to the ultrasonic waves of the transducer, and formed from a material which is partially reflective and partially transmissive of ultrasonic wave energy, such that the partition forms two sub-

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chambers which may hold and treat two single workpieces in a linear fashion, which is disclosed as an essential element of claimed invention, as described in claim 14.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: U.S. Patent No. 6,244,280 to Dryer *et al.*, which discloses the conventional use of both ultrasonic and megasonic as "sonic" cleaning in the semiconductor art; U.S. Patent No. 6,026,832 to Sato *et al.*, which discloses an ultrasonic cleaning system for wafers substantially cumulative to the above cited references; U.S. Patent No. 4,543,130 to Schwartzman, which discloses an ultrasonic/megasonic cleaning system for wafers substantially cumulative to the above cited references.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph L. Perrin, Ph.D. whose telephone number is (571)272-1305. The examiner can normally be reached on M-F 7:00-4:30, except alternate Fridays.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael E. Barr can be reached on (571)272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joseph L. Perrin, Ph.D.
Examiner
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A handwritten signature in black ink, appearing to read 'J. Perrin', written in a cursive style.

jl原因